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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,289	09/30/2003	Junichi Hoshi	03500.017625	4738

5514 7590 04/28/2006

FITZPATRICK CELLA HARPER & SCINTO  
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NEW YORK, NY 10112

EXAMINER
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SUNG, CHRISTINE

ART UNIT	PAPER NUMBER
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2884

DATE MAILED: 04/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/673,289

Applicant(s)

HOSHI, JUNICHI

Examiner

Christine Sung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 March 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Response to Amendment***

1. The amendment filed on March 2, 2006 has been entered.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 4-5 and 7-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (US Pre Grant Publication 2003/0025160 A1).

Regarding claim 1, Suzuki discloses a back side incident type image pickup sensor (Figure 3) having on the front side of a semiconductor substrate (element 32) a photoelectric conversion portion (element 37) and an electric circuit ("peripheral circuit portion"), and having on the back side of the semiconductor substrate an opening (element 33A) through which a radiation beam ("light") is incident, the incident radiation beam being detected by the photoelectric conversion portion (element 37) formed on the front side of the semiconductor substrate (see figure 3), wherein the electric circuit is disposed at a given distance in the horizontal direction from the opening (circuitry is next to the detection portion).

Regarding claim 2, Suzuki discloses that the substrate can be made of silicon (paragraph [0058]).

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Regarding claim 4, Suzuki discloses that the radiation beam is IR light (paragraph [0043]).

Regarding claim 5, Suzuki discloses that the sensor detects IR light (see paragraph [0043]) but does not specify the claimed range. However, by definition, IR light is radiation defined between 700nm- 1 mm.

Regarding claim 7, Suzuki discloses that the photoelectric conversion portion is composed of a photodiode (element 37).

Regarding claim 8, Suzuki discloses that the electric circuit (element “peripheral circuit portion”) serves as one of a driver circuit for driving the photoelectric conversion portion (paragraph [0003]) and a signal processing circuit for processing a signal from the photoelectric conversion portion (paragraph [0003]).

Regarding claims 9-10, Suzuki discloses that the given distance (several hundred microns, see figure 3) is greater than  $0.303 \times 10$  microns (see figure 3) = 3 microns. Therefore several hundred microns is greater than approximately 3 microns.

Regarding claim 11, Suzuki does not explicitly state using a dummy pixel, but however discloses a functionally similarly element that is formed at an offset portion (Figure 3, element PWELL) between the electric circuit and opening (see figure 3) for removing electric charge in the offset portion. Although Suzuki does not explicitly state that it is a dummy pixel, the structural element is present in the invention as disclosed by Suzuki.

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Regarding claim 12, Suzuki discloses a diffusion region (figure 3, element PWELL) for absorbing electric charges is formed in the offset portion between the electric circuit on the front side of the semiconductor substrate and the opening (see figure 3, PWELL closest to electric circuit side).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (US Pre Grant Publication 2003/025160).

Regarding claim 3, Suzuki discloses using various etching techniques (see figures 7 and 8) whereby the elements of figures 3 and 9 are formed. Although Suzuki does not explicitly state that the substrate is reduced in thickness after the photo conversion portion is formed, it is obvious that during the conventional etching techniques the substrate on which the photo

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conversion element is formed is reduced in thickness in order to accommodate the conversion elements.

Regarding claim 6, Suzuki discloses detecting various types of radiation {see paragraph [0043], visible, infrared, and UV). Suzuki does not explicitly state detection of x-ray, such radiation is conventionally detected using solid state detectors. Therefore one of ordinary skill in the art would be motivated to detect x-rays with the invention as disclosed by Suzuki for applications where high energy radiation is detected.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection. (see above).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 571-272-2448. The examiner can normally be reached on Monday- Friday 7-3 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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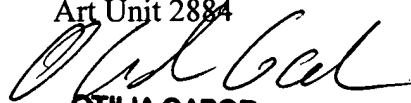
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CS

Christine Sung

Examiner

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**OTILIA GABOR**  
**PRIMARY EXAMINER**